

Claims:

1. A method for forming a hardened cement in a bone cavity comprising the following steps:

- 5 a) preparing a cement paste from a powder and a liquid, so that said cement paste is injectable through a syringe;
- b) disposing a pocket in a bone cavity; said pocket is made from a material penetrable to said liquid but substantially impenetrable to the powder of said cement paste;
- c) injecting said cement paste into said pocket;
- 10 d) applying a pressure unto said cement paste before said cement paste is substantially hardened, causing a portion of said liquid to be squeezed out of said pocket, so that the powder/liquid ratio of said cement paste in said pocket is increased; and
- e) allowing said cement paste to harden in said pocket.

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2. The method according to claim 1 further comprising:

- f) opening said pocket; and
- g) separating the resulting opened pocket from the hardened cement.

20 3. The method according to claim 2, wherein said injecting in step c) and said opening in step f) is carried out with a means which is able to be operated outside said bone cavity, and the resulting opened pocket is attached to said means.

25 4. The method according to claim 3, wherein said separating in step g) is carried out by removing the resulting opened pocket from said bone cavity with the hardened cement remaining in said bone cavity.

5. The method according to claim 1, wherein said pocket is made  
30 from a fiber cloth or a polymer foil.

6. The method according to claim 5, wherein said pocket is made from said fiber cloth, and said fiber cloth is biodegradable, and said

method further comprises leaving the hardened cement resulting from step e) together with the pocket in said bone cavity.

7. The method according to claim 2, wherein said pocket is made  
5 from a fiber cloth or a polymer foil, wherein said opening in step f) comprises cutting at least a portion of said pocket with a blade or a thin wire.

8. The method according to claim 2, wherein said pocket is made  
10 from a fiber cloth, wherein said opening in step f) comprises loosening or unthreading at least a portion of said fiber cloth.

9. The method according to claim 3, wherein said means comprises  
a syringe tube having an injection end; a mounting mechanism at said  
15 injection end for mounting said pocket to said injection end; a first set of wire holders on an outer surface of said syringe, which are spaced apart along a longitudinal direction of said syringe; a second set of wire holders on said outer surface of said syringe, which are spaced apart along said longitudinal direction of said syringe, wherein an imaginary plane formed  
20 by said first set of wire holders and said second set of wire holders divides the syringe into halves; and said thin wire which is slidably received said first set of wire holders and said second set of wire holders with a portion thereof passing across said injection end of said syringe.

25 10. The method according to claim 3, wherein said means comprises a syringe having an injection end; a mounting mechanism at said injection end for mounting said pocket to said injection end; a thin tube on an outer surface of said syringe along a longitudinal direction of said syringe; and said blade slidably received in said thin tube, said blade having a  
30 retractable blade and a rod connected to said retractable blade at one end thereof, so that said retractable blade received in said tube is able to protrude from said injection end of said syringe by pushing the rod, and thus said pocket can be cut by said retractable blade, and that said

protruding retractable blade can be retracted by pulling the rod.

11. The method according to claim 9, wherein said means further comprises a thin tube on said outer surface of said syringe along said  
5 longitudinal direction of said syringe; and said blade slidably received in said thin tube, said blade having a retractable blade and a rod connected to said retractable blade at one end thereof, so that said retractable blade received in said tube is able to protrude from said injection end of said syringe by pushing the rod, and thus said pocket can be cut by said  
10 retractable blade, and that said protruding retractable blade can be retracted by pulling the rod.

12. The method according to claim 9, wherein said mounting mechanism comprises an annular groove formed on said outer surface of  
15 said syringe and an elastic ring having a shape and size corresponding to those of the said annular groove, so that a neck of said pocket can be clamped by said elastic ring received in said annular groove of said syringe after said injection end of said syringe being inserted into an opening of said pocket.

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13. The method according to claim 10, wherein said mounting mechanism comprises an annular groove formed on said outer surface of said syringe and an elastic ring having a shape and size corresponding to those of said annular groove, so that a neck of said pocket can be  
25 clamped by said elastic ring received in said annular groove of said syringe after said injection end of said syringe being inserted into an opening of said pocket.

14. The method according to claim 1, wherein said pressure is of  
30 about 0.1-200 MPa.

15. The method according to claim 14, wherein said pressure is of about 0.5-50 MPa.

16. The method according to claim 14, wherein said pressure is measured in-situ with a pressure sensor.

- 5        17. The method according to claim 1, wherein said cement paste comprises a calcium phosphate-based cement, a calcium sulfate-based cement, or a bioactive glass-based cement.